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09/938,291	08/24/2001	Shunpei Yamazaki	0756-2353	1025

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EXAMINER

ROY, SIKHA

ART UNIT

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2879

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/938,291	YAMAZAKI ET AL.
	Examiner	Art Unit
	Sikha Roy	2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 24 August 2001.

2a) This action is **FINAL**.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) \_\_\_\_\_ is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-59 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.

4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.

5) Notice of Informal Patent Application (PTO-152)

6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Specification***

The disclosure is objected to because of the following informalities:

Page 5 lines 23 and 25 Chemical Formula 1 and Chemical Formula 2 are not provided and hence the variables 'M' in line 27 and 'n' in line 28 do not have any antecedent basis.

Appropriate correction is required.

Claims 22-38 are objected to because of the following informalities:

In claims 22-38 'transporting layer' should be replaced by --hole transporting layer--.

Appropriate corrections are required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,2, 4, 5, 20, 22, 23 and 57,58 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,097,147 to Baldo et al. in view of U. S. Patent 5,457,565 to Namiki et al .

Baldo et al. disclose (column 5 lines63-65, column 6 lines 5-15 Fig. 3) a light emitting device comprising a substrate 510 having a pixel portion (plurality of pixels) with plurality of EL elements where the EL layer 513 comprises CBP doped with PtOEP, a triplet compound.

Referring claim 1 Baldo et al. disclose one hole transporting layer 512 formed of NPD. Baldo et al. do not exemplify the EL layer comprising plurality of hole transporting layers.

Namiki et al. in analogous art of organic electroluminescent device disclose (column 4 lines 15-27, 60-67 Fig.6) the EL device comprising two positive hole transporting layers 4a and 4b. The first layer 4a made of MTDATA has a high melting point and a high glass transition point and is hardly crystallized and further has an excellent thin-film formation property. The first hole transporting layer having high conductivity prevents undesired heat influence to the second layer upon application of electric currents.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the single hole transporting layer (NPD) of the device of Baldo et al. by adding another layer of MTDATA below and in contact with anode as taught by Namiki et al. for preventing undesired heat influence to the layer on the top, upon application of electric currents.

Regarding claims 4 and 57 Baldo et al. disclose (column 5 lines 57-61) that the light emitting display device can be used in electric appliances such as computer monitors, telecommunication devices. Otherwise claim 4 essentially recites the same limitation as of claim 1 and hence is rejected for the same reason.

Regarding claim 2 Baldo and Namiki et al. disclose all the limitations which are same as of claim 1. Furthermore Namiki et al. disclose (column 3 lines 1-5) light emitting layer comprised of quinoline derivative such as tris(8-quinolino)aluminum referred as Alq<sub>3</sub>, a singlet compound which comprises the second EL element in addition to the first EL element comprising triplet compound as disclosed by Baldo et al..

Claims 5 and 58 recite the same limitations as of claim 2, the light emitting device being used in an electric appliance such as computer monitor, telecommunication device and hence are rejected for the same reason as of claim 2.

Regarding claims 20, 22 and 23 Baldo et al. in view of Namiki et al. disclose the hole transporting layer has a laminate structure of two layers containing MTDATA and  $\alpha$ -NPD.

Claims 3,6, 7, 8-19, 21, 24-38, 39-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 6,097,147 to Baldo et al. and U. S. Patent 5,457,565 to Namiki et al. and further in view of U.S. Patent 5,928,802 to Shi et al.

Referring to claim 3 Baldo et al. disclose (column 3 lines 60-67, column 4 lines 1-10 Fig.2) the EL layer comprising substrate having a pixel portion, one EL element comprising an anode, a hole transporting layer 112, light emitting layer 113 made of a triplet compound (CBP doped with PtOEP) in contact with the hole transporting layer, a

hole blocking layer 114 in contact with the light emitting layer, an electron transporting layer 115 in contact with the light emitting layer and a cathode 117 in contact with the electron transporting layer.

Claim 3 differs from Baldo and Namiki et al. in that Baldo and Namiki et al. do not exemplify the hole injection layer in contact with the anode and deposited under the hole transporting layer.

Shi et al. in relevant art of organic electroluminescent devices disclose (column 4 lines 45-55 Fig.3) an hole injection layer 310 in contact with the anode 304 to improve the injection efficiency of the anode.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a hole injection layer as taught by Shi et al. in between the anode and the hole transport layer of the EL device of Baldo and Namiki et al. to improve the injection efficiency of the anode.

Claims 6 and 59 recite the same limitations as of claim 3, the light emitting device being used in an electric appliance and hence is rejected for the same reason as of claim 3.

Regarding claim 7 Shi et al. disclose the hole injection layer made of copper phthalocyanine (column 6 line6). Baldo et al. and Namiki et al. disclose (column 6 lines 5-17) the hole transporting layer containing MTDATA and  $\alpha$ -NPD, light emitting layer containing CBP doped with PtOEP, the hole blocking layer containing BCP and the electron transporting layer containing Alq<sub>3</sub>.

Baldo, Namiki and Shi et al. do not disclose the light emitting layer containing CBP and Ir (ppy)<sub>3</sub>. The selection of known material for a known purpose is generally considered to be within the skill of the art. It would have been obvious to use CBP doped with Ir (ppy)<sub>3</sub> (both CBP with PtOEP and CBP with Ir (ppy)<sub>3</sub> being triplet compounds emitting different colors) because the selection of known materials for a known purpose is within the skill of art.

Regarding claim 8 Baldo et al. disclose (column 4 lines 38-67, column 5 lines 1-35) different light emissive organic compounds for blue, green and red emission. It is well known (as evidenced by Namiki and Shi et al.) in the art that a preferred embodiment of a luminescent layer comprises multi-component material consisting of a host material doped with one or more components of fluorescent dyes and EL devices can be tuned by using fluorescent dyes of different emission wavelengths in a common host material. For EL element containing triplet compounds the suitable host material is CBP and green, blue and red phosphors may be chosen to emit green, blue and red light respectively. Shi et al. disclose tris (8-quinolinato) aluminum which produces excellent green luminescence. Blue dopants include tetracene, perylene and other conjugated benzenoids. Coumarins, rhodamins are used as dopants for EL emissions at longer wavelengths. A pixel portion referring to an addressable unit contains pixels of red, green and blue light emission. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to select the first EL element with triplet compound of Baldo et al. emitting red light and other second element emitting blue or green as disclosed by Shi et al. for producing multicolor display screen.

Claims 9-19 essentially recite the same limitation as of claim 8 selecting different combination of color of the emitted light from first and second EL elements and hence are rejected for the same reason.

Claim 21 essentially recites the same limitation as of claim 20 and hence is rejected for the same reason (see rejection of claim 20).

Claims 24-38 essentially recite the same limitation as of claim 23 and hence are rejected for the same reason (see rejection of claim 23).

Referring to claim 39 Baldo and Namiki et al. disclose the first layer of the hole transporting layer is made of MTDATA for its high conductivity and excellent thin-film formation property and the second layer is made of  $\alpha$ -NPD and the light emitting layer is in contact with the second hole transporting layer. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to specify the second layer containing  $\alpha$ -NPD sandwiched between the first hole transporting layer containing MTDATA and light emitting layer of Baldo and Namiki et al.

Claims 40-56 essentially recite the same limitation as of claim 39 and hence are rejected for the same reason (see rejection of claim 39).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art references are cited to further show the state of the art with respect to organic electroluminescent devices.

U. S. Patent 6,310,360 to Forrest et al.

U. S. Patent 6,433,486 to Yokoyama.

U. S. Patent 6,358,633 to Sano et al. discloses two laminated hole transporting layers comprising MTDATA and  $\alpha$ -NPD.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (703) 308-2826. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

S. Roy  
Sikha Roy  
Patent Examiner  
Art Unit 2879



ASHOK PATEL  
PRIMARY EXAMINER